MSC Guidelines for Review of Passenger Vessel Intact Stability (Subchapters K & H)

Procedure Number: H2-3 Revision Date: 12/22/99

References

a. 46 CFR 170, Subpart C, "Plan Approval"

b. Marine Safety Manual, Volume IV, Chapter 6, Section E, Item 12, "Multi Hull Vessels"

c. International Code of Safety for High-Speed Craft (HSC Code)

d. Marine Safety Center Technical Note (MTN) 01-93, "Intact Stability Considerations for Glass Panels/Windows Located Above the Bulkhead Deck on Subchapter H & T Vessels"

e. Commandant (G-MTH-5) Policy File Memorandum (PFM) 10-85, "Watertight and Weathertight Closure Devices"

Disclaimer

These guidelines were developed by the Marine Safety Center staff as an aid in the preparation and review of vessel plans and submissions. They were developed to supplement existing guidance. They are not intended to substitute or replace laws, regulations, or other official Coast Guard policy guidance. The responsibility to demonstrate compliance with all applicable laws and regulations still rests with the plan submitter. The Coast Guard and the U. S. Department of Transportation expressly disclaim liability resulting from the use of this document.

Contact Information

If you have any questions or comments concerning this document, please contact the Marine Safety Center by e-mail or phone. Please refer to the Procedure Number: H2-03

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General Review Guidance

If the vessel's stability is being reviewed under Navigation and Vessel Inspection Circular (NVIC) No. 3-97, "Stability Related Review Performed by the American Bureau of Shipping for U.S. Flag Vessels" (http://www.uscg.mil/hq/g-m/nvic/index90.htm#1997), then MSC review of stability items is not required.

Check that the following items are included in the submittal package:

- General Arrangements including deck plans, hold plans (clearly indicating compartmentation and watertight doors), inboard and outboard profiles (clearly indicating potential downflooding points such as vents or windows).
- Lines, offsets or computer disk with hull model (GHS preferred)
- Tank Capacity Tables/Plan with Free Surface data
- Draft mark locations, longitudinal and vertical reference points
- Stability Test/Lightship results
- Intact Stability Calculations
- Trim and Stability Booklet (if necessary)

Ensure that lightship characteristics were (or are to be) determined using one of the following methods:

- Acceptance as a sister to a vessel with known characteristics.
- Deadweight survey combined with a conservatively assumed vertical center of gravity (VCG) height
- Inclining (full stability test).

Ensure compliance with the appropriate requirements of 46 CFR 171 Subparts F, G, and H for Watertight Integrity Below the Bulkhead Deck, Watertight Integrity Above the Margin Line, and Drainage of Weather Decks, respectively.

If designated as a High Speed Craft (IMO HSC), ensure that calculations demonstrate compliance with Chapter 2, parts A and B, of reference (c).

Loading Conditions

Ensure that vessel loading conditions cover the entire range of operation including the "passengers at refuge" condition when appropriate.

Ensure that loading conditions incorporate liquid free surface in accordance with 46 CFR 170.285.

Ensure that liquid free surface has been accounted for in each condition of loading and operation.

Weather Criterion

Ensure calculations demonstrate compliance with the Weather Criterion (46 CFR 170.170) and that GM available meets or exceeds the minimum acceptable value in each condition of loading and operation.

Ensure that the Weather Criterion calculation reflects the correct "P" factor (for service and vessel length), "W" (displacement), and "T" for each condition of loading and operation.

Ensure the Weather Criterion calculation "A" and "H" values correspond to the windage areas and centers shown on the profile plan.

Passenger Criterion

Ensure calculations demonstrate compliance with the Passenger Criterion (46 CFR 171.050) and that GM available meets or exceeds the minimum acceptable value in each condition of loading and operation.

Ensure that the Passenger Criterion calculation reflects the correct number of passengers, "b", and "T" (different from the Weather Criterion "T") for each condition of loading and operation.

Righting Energy

Ensure calculations demonstrate compliance with the Righting Energy Criterion (46 CFR 170.173) as appropriate (all vessels under 328 feet in length) and that the indicated stability characteristics meet the minimum requirements for the appropriate service (protected, partially protected, exposed) in each condition of loading and operation. For mechanically propelled multi-hull vessels such as SWATH's, the equivalency criteria of reference (b) may be substituted for 46 CFR 170.173.

Ensure that the Righting Energy calculations reflect the appropriate criteria for vessel service and that all criteria are addressed. Ensure that these calculations correctly reflect submergence of any potential downflooding points.

Hull Model

The MSC will generate a hull model from the lines, offsets or provided computer disk using GHS to verify the stability of the vessel.

Definitions

Downflooding: The entry of seawater through any opening into the hull *or superstructure* of an undamaged vessel [or portion of a vessel] due to heel trim or submergence of the vessel.

Downflooding Point: Any opening in the hull or superstructure of the vessel that cannot be closed watertight and through which downflooding can occur. (Generally speaking for openings which remain above the static waterline, weathertight closures are sufficent to prevent downflooding and are accepted as such.)

Weathertight: Water will not penetrate into the vessel in any sea condition. This also means being able to resist boarding seas. As addressed in reference (d), windows are not accepted as weathertight closures and, without the provision of deadlight covers, must be considered as potential downflooding points. Ball check valves used in tank vent lines are generally accepted as weathertight closures.

Watertight: Capable of preventing the passage of water through the structure in any direction under a head of water for which the surrounding structure was designed.